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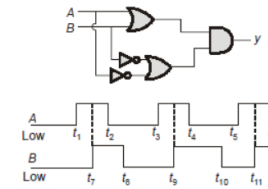
FULL SYLLABUS DEMO TEST : (CS) - REPORTS

OVERALL ANALYSIS | COMPARISON REPORT | SOLUTION REPORT

ALL(65) | CORRECT(43) | INCORRECT(14) | SKIPPED(8)

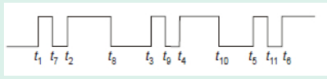
Q. 41 Have any Doubt ?

The input to the circuit are shown below:

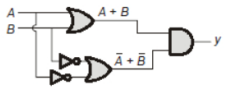


The output waveform y will be the form

A Correct Option



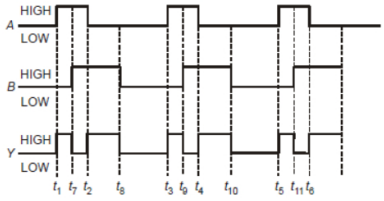
Solution :
(a)



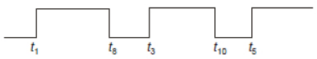
$$= (A+B)(\bar{A}+\bar{B})$$

$$= A\bar{B} + \bar{A}B$$

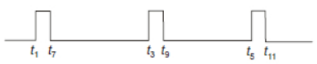
$$= A \oplus B$$



B



C

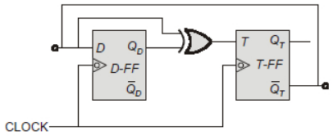


D None of the above — Your answer is **IN-CORRECT**

QUESTION ANALYTICS +

Q. 42 Have any Doubt ?

A digital circuit is designed with one D-flip flop and one T-flip flop.



The initial value of Q_DQ_T = 0 0, then after how many clock pulses, the Q_DQ_T = 10 will appear

A 4

B 6

C 8

D Never — Correct Option

Solution :
(d)

			FFD	FFT
	Q_D	Q_T	$D = \overline{Q}_T$	$T = \overline{Q}_T \oplus Q_D$
Clock pulse	0	0	1	1
1	1	1	0	1
2	0	0	1	1
3	1	1	0	1
4	0	0		

So, output will either be 00 or 11 and never 10.

QUESTION ANALYTICS +

Q. 43 Have any Doubt ?

Consider a scenario of modified quick sort, where we have given an input sorted array A[1 . . . n], all elements of array are distinct and n ≥ 3. Pivot is the median of set of 3 elements [First element, middle element, and last element]. What will be worst case time complexity of modified quick sort?

A $O(n^2)$ — Your answer is **IN-CORRECT**

B $O(n \log n)$ — Correct Option

Solution :
(b)
Since the given array is sorted to find the first middle and last element will take constant time i.e., O(1).
The median of these three elements will be find in O(1) time which will the pivot element.
The selected pivot element will divide the given array in two parts each contain approx $n/2$ elements.
So, the recurrence relation

$$T(n) = 2T(n/2) + O(n) \qquad [\because \text{For portions} = O(n)]$$

After solving the recurrence we get

$$= O(n \log n)$$

C $O(n^2 \log n)$

D $O(n \log \log n)$

QUESTION ANALYTICS +

Q. 44 Have any Doubt ?

Let a be an array containing n integers in decreasing order. The following algorithm determiner whether there are two distinct numbers in the array whose difference is a specified number where S > 0.

```
i = 0; j = 1;
while (j < n)
{
    if(E) j++;
    else if(a[i] – a[j] == S) break;
    else i++;
}
if (j < n) printf("yes");
else printf("no");
```

Which of the following is correct expression for E?

A $a[j] - a[i] > S$

B $a[j] - a[i] < S$

C $a[i] - a[j] < S$ — Your answer is **Correct**

Solution :
(c)
Since, the numbers are arranged in decreasing order. So, the number at 0^{th} index will be the largest

largest.

Suppose the array with elements is given below:

5	4	3	2	1
0	1	2	3	4

Take $S = 4$ (difference between 2 element is 4)

$i = 0, j = 1$

So, $a[i] = 5; a[j] = 4; a[i] - a[j] = 1$

Since, S = 1 so we have to increment the value of j which will point the next element of the array.

Until our requirement $a[i] - a[j] == 4$ not satisfied we have to move right side of the given array.

If such 2 elements are not present in array then $a[i] - a[j] < S$ becomes false and program will return no i.e., elements not found.

So, the correct option is (c).

D $a[i] - a[j] > S$

QUESTION ANALYTICS +

Q. 45 Have any Doubt ?

In an weighted, directed connected graph, the shortest path between every pair of nodes in graph is computed most efficiently in terms of running time complexity, is given by which of the following algorithm?

A Applying DFS algorithm

B Applying Dijkstra's algorithm

C Applying Bellman-ford algorithm

D Applying Floyd-Warshall algorithm — Your answer is **Correct**

Solution :
(d)
Floyd-Warshall algorithm takes O((V)3) time.
Find minimum distance between 1-adjacent node take O(V2).
So for finding minimum distance between every pair of node it takes = V × O(V2) = O(V)3.
• Since DFS applying only on unweighted, undirected graph.
• Dijkstra algorithm fail when graph contain negative edge weight cycle and use only for find minimum distance from single source node to every other node.
• Bellman-Ford algorithm fail since it find shortest distance from one node to every other node.

QUESTION ANALYTICS +

Q. 46 Have any Doubt ?

Consider Relational Schema $R(A, B, C)$ and $S(A, B, C)$. (Consider the following queries given below)

1. Select *
   FROM R
   Where (A, B, C) in (Select *
   FROM S)
2. Select *
   FROM R
   Where EXISTS (Select *
   FROM S
   Where $R \cdot A = S \cdot A$ and $R \cdot B = S \cdot B$ and $R \cdot C = S \cdot C$)
3. Select *
   FROM R
   Where (A, B, C) NOT IN ((Select *
   FROM R
   Where (A, B, C) NOT IN (Select *
   FROM S))

Which of the following SQL expressions equal to $R \cap S$?

A Only 1

B Only 1 and 2

C Only 2 and 3

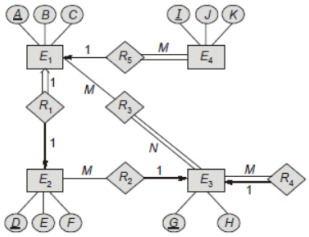
D All 1, 2, 3 — Your answer is **Correct**

Solution :
(d)
All the three SQL queries represents $R \cap S$.

QUESTION ANALYTICS +

Q. 47 Have any Doubt ?

Consider the following ER diagram:



What is the minimum number of tables required to represents above ER diagram?

A 3

B 4 Correct Option

Solution :
(b)

$E_1(\underline{ABC})$
$R_1(\underline{A}\ \underline{D})$
$E_2(\underline{DEF})$
$R_3(\underline{D}\underline{G})$
] $E_1R_1E_2R_3(\underline{ABC}\underline{D}EFG)$ G foreign key

$R(\underline{AG})$
$E(\underline{G}\ H)$
] $E_3R_4(\underline{AG}H)$

$R(\underline{G_1},\underline{G_2})$] $R_4(\underline{G_1},\underline{G_2})$

$R_5(\underline{A}\ 1)$
$E_4(\underline{A}JK)$
] $R_5E_4(\underline{AL}JK)$ A foreign key

C 5 Your answer is **IN-CORRECT**

D 6

QUESTION ANALYTICS +

Q. 48 Have any Doubt ?

Consider the following statements:
S_1 : Static allocation can not support recursive function.
S_2 : Stack allocation can support pointers but can not deallocate storage at run-time.
S_3 : Heap allocation can support pointers and it can allocate or deallocate storage at run-time.
Which of the above statements are true?

A S_1 and S_2

B S_2 and S_3

C S_3 and S_1 Correct Option

Solution :
(c)

- Since, static allocation is done for all objects at compile time and in case of recursion, it's not possible for compiler to decide as depth of recursion depends on recursion parameter. So recursive functions can't be implemented with static storage allocation.
- Stack allocation can support pointers and with help of pointers it can allocate and deallocate dynamic variables and hence can manage runtime storage.
- Heap allocation can also manage runtime storage and dynamic memory allocation with help of pointers.

D S_1, S_2 and S_3

QUESTION ANALYTICS +

Q. 49

Have any Doubt ?

Consider the following grammar:

$S \to A + A \mid A$

$A \to AB \mid B$

$B \to a \mid b$

Which of the given options is true regarding the grammar?

A Grammar is LL(1) but not LR(0)

B Grammar is not LR(0) but it is LL(1)

C Grammar is both LR(0) as well as LL(1)

D Grammar is neither LR(0) nor LL(1) — Correct Option

Solution :

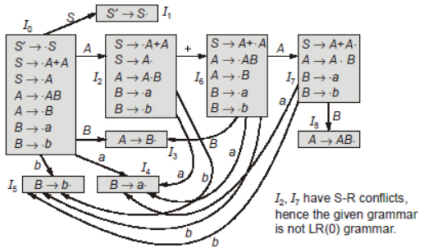
(d)

Checking for LL(1) grammar:

$$\begin{aligned} \text{Since first (s)} &= \text{First } (A+A) \cap \text{First } (A) \\ &= \text{First } (A) \cap \text{First } (A) \\ &= \{a, b\} \cap \{a, b\} \\ &= \{a, b\} \neq \{\in\} \end{aligned}$$

So, grammar is not LL(1).

Checking for LR(0) grammar:



So, the given grammar is neither LR(0) nor LR(1).

QUESTION ANALYTICS +

Q. 50

Have any Doubt ?

What is the number of seven digit integers possible with sum of the digits equal to 11 and formed by using the digits 1, 2 and 3 only?

A 210

B 49

C 161 — Your answer is Correct

Solution :

(c)

$$x_1 + x_2 + x_3 + \ldots + x_7 = 11$$

$$1 \le x_i \le 3 \text{ and } (1 \le i \le 7)$$

$$\text{Coefficient } x^{11} \Rightarrow (x^1 + x^2 + x^3)^7$$

$$\text{Coefficient } x^{11} \Rightarrow x^7(1 + x + x^2)^7$$

$$\text{Coefficient } x^4 \Rightarrow (1 + x + x^2)^7$$

$$\text{Coefficient } x^4 \Rightarrow \left(\frac{1-x^3}{1-x}\right)^7$$

$$\text{Coefficient } x^4 \Rightarrow \sum_{r=0}^{7} {}^7C_r(-x^3)^r \times \sum_{r=0}^{\infty} {}^{7-1+r}C_r x^r$$

$$\Rightarrow {}^7C_0 \times {}^{10}C_4 - {}^7C_1\,{}^7C_1$$

$$\text{Coefficient } x^4 \Rightarrow 210 - 49$$

$$\Rightarrow 161$$

D 259

QUESTION ANALYTICS −

Level : Difficult

Accuracy

12.53%

Topper's Time

00:03:43 hrs

Correct Marks : 2

Correct Marks : 2

Negative Marks : 0

Average Time

01:10 min

Your Time

00:09:03 hrs